

# Awareness and practice regarding contact lens wearing and related complications among Jazan University students; Saudi Arabia

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**Author Affiliation:**

<sup>1</sup>Department of Family and Community Medicine, Faculty of Medicine, Jazan University, Jazan, Kingdom of Saudi Arabia

<sup>2</sup>Faculty of Medicine, Jazan University, Jazan, Kingdom of Saudi Arabia

**✉ Corresponding author**

Department of Family and Community Medicine, Faculty of Medicine, Jazan University, Jazan, Kingdom of Saudi Arabia

Email: oalbasheer@jazanu.edu.sa

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**Osama B Albasheer<sup>1✉</sup>, Amani Osman Abdelmola<sup>1</sup>,  
Amaal Hanani<sup>2</sup>, Afnan Zoghby<sup>2</sup>, Asma Mrair<sup>2</sup>, Fatimah  
Badawi<sup>2</sup>, Sameera Hakami<sup>2</sup>, Ghaidaa Abuhekmah<sup>2</sup>, Lama  
Ayoub<sup>2</sup>, Alanoud Hakami<sup>2</sup>**

**ABSTRACT**

**Purpose:** The aim of the study was to determine the knowledge, attitude and practice regarding contact lens wearing and to sketch out the common related complications among Jazan University students. **Method:** A cross-sectional questionnaire based study conducted among 440 Jazan university students. The questionnaire was structured to gather information related to the participants' socio-demographic data, level of knowledge and practice. **Results:** out of total (440 participants), 198 (45%) were using contact lenses, 184 (93%) were female and 14 (7%) were male. Total knowledge was excellent in (50%) of the participants with significant gender difference ( $P$  value = 0.000). Cosmetic reasons were the indication for contact lens wearing in 67% of the participants, while therapeutic reasons were only indicated in 12% of them. 83.9% of the contact lens wearers exhibited excellent practice with hand hygiene and cleaning and 61.9% never or rarely shared their contact lenses with others. **Conclusion:** The prevalence of contact lens wearing was high among Jazan University students. The students have adequate knowledge and good practice regarding contact lens wearing. Even though, periodic eye check-up before contact lens wearing is still need to be reinforced.

**Keywords:** contact lens; knowledge; practice; red eye; corneal abrasion

**1. INTRODUCTION**

Contact lenses (CL) are optical devices worn on the eye, placed directly on the surface of the cornea (Collins, 1986). They are of many kinds; hard, soft, semi-soft, and, gas permeable lenses. In addition to correcting refractive errors and other therapeutic reasons, CL are used for cosmetic enhancement and getting

more popular among younger population (school and university students) (Kumar & Yousef, 2013; Arif & Hussain, 2017).

Contact lenses are usually safe when they used properly. The advantages of CL increase their demand worldwide and as the popularity and demand of contact lenses increase, wearing related problems also increase. This may be due to lack of knowledge, poor compliance and inadequate practice about proper care of contact lens (Wagner et al., 2014). Corneal abrasion, corneal ulcer, keratitis, dry eye and conjunctivitis are common complications from contact lens wearing (Arif & Hussain, 2000; Efron & Morgan, 2006). The awareness about these complications was lacking among the young users, and the majority of them preferred contact lens use in spite of the ocular complications due to cosmetic reasons (Hall & Jones, 2010; Janti et al., 2014). Increase the awareness and careful practice regarding CL wear, by using effective ocular health education, can prevent complications resulting from the wearer's inappropriate behavior (Szczotka-Flynn, 2010).

Knowledge and practice among CL wearers in Saudi population was less than the desired in many previous studies (Alobaidan et al., 2018; Hana et al., 2017). To the best of our knowledge there was no study in Jazan region to examine CL wearing and related ocular problems. Therefore, this study was intended to assess the knowledge, attitude, practice and related complications of contact lens wearing among Jazan University students.

#### **Public health importance**

The current study assessed the awareness and related complications of contact lens wearing among college students of Jazan University. People around the world use contact lenses for different reasons. Knowledge and practice among CL wearers in Saudi population was less than the desired in many previous studies, even though large numbers of the young adults are wearing contact lenses. Poor hygienic practice and decreased awareness of contact lens guidelines are the main factors behind contact lens- related complications.

## **2. METHODOLOGY**

#### **Setting and design**

A cross-sectional descriptive study conducted among Jazan university students during the period between April 2018 and May 2019. Jazan University, one of the biggest public research institutions of higher education in Saudi Arabia, based in Jazan Region with 26 faculties and more than 55,000 students (Al Bahhawi et al., 2018)

#### **Sample size**

The estimated sample size for this study was 440, using the Epi Info program formula. The calculation of the sample size was conducted on the presumption that confidence level (95%), margin of error not more than (5%), non-response rate of 10% and prevalence of contact lens among the population of (50%), as no previous study is available in the region.

#### **Sample technique**

The sample was made using multistage simple random stratified technique. Colleges were divided into two strata (health and non-health colleges), then participants from each stratum were selected randomly, according to their number (two colleges from healthy stratum and four colleges from non-healthy stratum).

#### **Data collection techniques**

Data were collected using well-structured questionnaire. Participants were clearly informed about the objectives of the study, they were able to withdraw at any time, without giving a reason, and their responses will be kept confidential. Students studying in Jazan University, male or female, and agree to participate in the study were acquainted to complete the questionnaire. Informed consent was obtained.

The questionnaire comprised of four parts. First part gathered information related to the participants' socio-demographic characteristics like; age, gender, type of college (medical, science or literary), students' level, residence (urban or rural) and monthly income. Second part evaluated participants' knowledge about contact lenses. This part included 10 items. The responses to knowledge items are either true or false, with an additional "don't know" option. Correct answers were given a score of one. A score of zero were given to incorrect or uncertain (don't know) responses. Levels of knowledge were categorized as; high (71-100%), intermediate (51-70%) or poor (0-50%), based on Cronbach's  $\alpha$  coefficient. Cronbach's alpha coefficient of 0.71, indicating internal reliability (Taber, 2018). The third part evaluated participants' attitude toward contact lenses usage. This part included 10 items,

using a five-point Likert scale. Total scores ranged from 10 to 50. Participants with high scores were having positive attitudes. The last part of the questionnaire evaluated contact lens-related complications, using yes or no questions.

#### Data presentation & analysis

Collected data was verified manually and then entered to a personal computer and analyzed by using the Statistical Package for the Social Sciences (SPSS version 22). Descriptive statistics were used for qualitative variables while mean and standard deviation (SD) were used for quantitative variables. The appropriate tests of significance, (e.g., chi Square), was applied.

#### Ethical approval

The study was approved by the Institutional Ethics Research Committee, Faculty of Medicine, Jazan University, under the course of epidemiology and biostatistics (CLC 431).

### 3. RESULTS

Table 1 represented the demographic characteristics of participants: out of total (440 participants), 198 (45%) were wearing contact lenses, 184 (93%) were female while 14 (7%) were male. From the contact lens wearers; 95(49%) were from literary college, 57(29%) were from scientific college and 42(22%) were from medical college. Two-third (62%) of the contact lens wearers were from rural region.

**Table 1** Prevalence of contact lens wearing with relation to the demographic characteristics of the participants

		Wearers	Non wearers	Total
<b>Gender</b>	Male	14 (8%)	151 (92%)	165
	Female	184 (67%)	89 (33%)	273
	Medical	42 (40%)	63 (60%)	105
<b>Specialization</b>	Scientific	57 (41%)	81 (59%)	138
	Literary	95 (52%)	87 (48%)	182
<b>Residence</b>	Rural	121 (46%)	144(54%)	265
	Urban	74 (46%)	87 (54%)	161
<b>Monthly income</b>	500-1000	89 (45%)	108 (55%)	197
	1000-2000	44 (45%)	53 (55%)	97
	More than 2000	50 (46%)	58(54%)	108

There was significant variation in the level of knowledge with regard to the gender difference ( $p$  value = 0.000). In the female; the level of knowledge was excellent in 162 (59.3%), average in 83 (30.4%) and poor in 28 (10.3%). While in the male; the level of knowledge was excellent in 68 (41.2%), average in 35 (21.2%) and poor in 62 (37.6%). There were no significant differences with regard to specialization, residency and monthly income ( $p$  value; 0.191, 0.721, 0.538 respectively) (Table 2).

The participants reflected different information with regard to contact lens wearing (table 3); 67% of them used contact lens for cosmetic reasons, while 12% of them indicated their use for medical causes. 55% of the wearers agreed upon the important of having an eye examination before contact lens wearing and 48% agreed upon the important of having periodic check-up. Internet, friends and families represented the main source of information (30%, 29%, and 26 % respectively).

**Table 2** Factors associated with contact lens knowledge of the participants

Variables	Total Knowledge			P value
	Poor	Intermediate	High	
Gender	Male	62 (37.6%)	35 (21.2%)	68 (41.2%)
	Female	28 (10.3%)	83 (30.4%)	162 (59.3%)
Specialization	Medical	19 (18.1%)	22 (21.0%)	64 (61.0%)
	Scientific	34 (24.6%)	41 (29.7%)	63 (45.7%)
Residence	Literary	35 (19.2%)	51 (28.0%)	96 (52.7%)
	Rural	57 (21.5%)	69 (26.0%)	139 (52.5%)
Monthly income	Urban	30 (18.6%)	46 (28.6%)	85 (52.8%)
	500-1000	45 (22.8%)	49 (24.9%)	103 (52.3%)
More than 2000	1000-2000	16 (16.5%)	26 (26.8%)	55 (56.7%)
	2000	22 (20.4%)	34 (31.5%)	52 (48.1%)

**Table 3** Information related to contact lens wearing

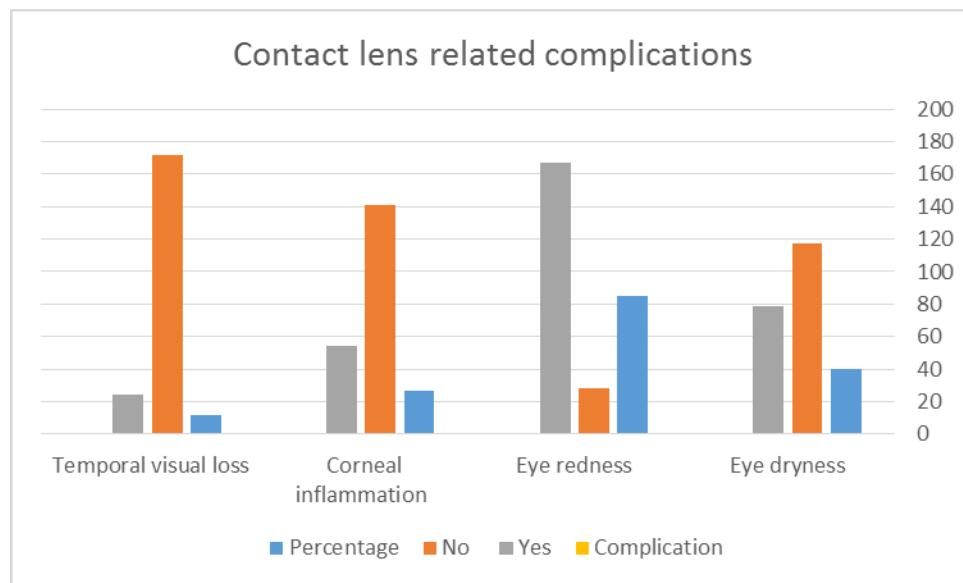
		Number	Percentage %
Indication for contact lens use	Medical	26	12
	Cosmetics	142	67
	Medical and cosmetics	44	21
Examining the eye before using contact lenses	Yes	239	55
	No	77	18
	Don't know	119	27
Periodic check up	Yes	209	48
	No	58	13
	Don't know	171	39
Source of information	Internet	177	30
	Doctors	77	13
	Family	158	26
	Friends	172	29
	Others	13	2

Table 4 presented the contact lens practice among the participants; regarding sharing the contact lens with others; 61.9% of the wearers never or rarely shared the contact lens with others, while 19.2% of the wearers always or frequently share contact lens with others. 73.1% of the wearers used to clean the contact lenses after each use and only 10.4% rarely or never clean them after each use. The majority of the wearers (83.9%) used to clean their hands before wearing or removing the contact lenses, while only 2.1% of them never clean their hands before wearing or removing of them. With regard to the use of contact lens solution for cleaning; 90% of the wearers used it for cleaning and only 2.1% of them never used it for cleaning. Other responses to the different practical questions were presented in table 4.

**Table 4** Practice with regard to contact lens use

	Always	Frequently	Sometimes	Rarely	Never	Total
Sharing contact lens with others	21 (10.9%)	16 (8.3%)	36 (18.8%)	26 (13.5%)	93 (48.4%)	192 (100%)
Replacement of contact lenses after expiration	89 (46.4%)	26 (13.5%)	28 (14.6%)	12 (6.3%)	37 (19.3%)	192 (100%)
Storing and sterilization of contact lenses	9 (4.6%)	21 (10.8%)	31 (15.9%)	33 (16.9%)	101 (51.8%)	195 (100%)
Cleaning of contact lenses after each use	108 (56%)	33 (17.1%)	32 (16.6%)	14 (7.3%)	6 (3.1%)	193 (100%)
Cleaning of the hands before wearing or removing contact lenses	139 (72%)	23 (11.9%)	22 (11.4%)	5 (2.6%)	4 (2.1%)	193 (100%)
Cleaning the contact lens box	108 (56.3%)	35 (18.2%)	35 (18.2%)	10 (5.2%)	4 (2.1%)	192 (100%)
Using contact lens solution for cleaning	149 (78%)	23 (12%)	12 (6.3%)	3 (1.4%)	4 (2.1%)	191 (100%)
Replacement of the lens solution after its expiration	97 (50%)	26 (13.4%)	28 (14.4%)	12 (6.2%)	31 (16%)	194 (100%)
Sleeping when wearing contact lenses	7 (3.6%)	7 (3.6%)	7 (3.6%)	10 (5.1%)	164 (84.1%)	195 (100%)
Swimming when wearing contact lenses	5 (2.6%)	4 (2.1%)	11 (5.8%)	4 (2.1%)	166 (87.4%)	190 (100%)

Figure 1 represented the different contact lens related complication in this study. Eye redness was the most common related complication (82%), followed by eye dryness (40%) and corneal inflammation (24%). Visual loss was less reported (10%).

**Figure 1** Contact lens- related complications

#### 4. DISCUSSION

As far as we know, there was no literature available about the awareness and practice of contact lens wear and usage in university students from Jazan University, even though large numbers of the young adults are wearing contact lenses (Loh & Agarwal, 2010). Poor hygienic practice and decreased awareness of contact lens guidelines are the main factors behind contact lens- related

complications (Lam et al., 2013). In the current study, nearly half of the participants were contact lens wearers. This finding was consistent with different previous studies (Abbouda et al., 2016; Lee et al., 2000; Bamahfouz et al., 2016) which indicated widespread use of contact lens. On the other hand, much lower prevalence of contact lens wearing was reported in India, and Malaysia (Giri et al., 2012; Tajunisah et al., 2008). This could be explained by the limited study populations used in these studies.

In this study, contact lens wearing was more prevalent in the female students. Same finding were reported among students in Italy, Saudi Arabia, Malaysia and India (Abbouda et al., 2016; Bamahfouz et al., 2016; Tajunisah et al., 2008; Harshila et al., 2018). A comparative study in Pakistan related this gender difference to the fashion practice of the females (Arif & Hussain, 2017). Other explanation could be explained by the cosmetic advantages offered by contact lenses which tend to attract more females, as two-third of the wearers in this study indicated cosmetic reasons and only tenth of them indicated therapeutic reasoning. In keeping with the observation, cosmetic reasons for contact lens wearing were more prevalent in variable previous studies (Giri et al., 2012; Tajunisah et al., 2008; Bamahfouz, et al., 2016; Lembach, 2003). In contrast, therapeutic reasons were observed as the main reasons for contact lens wearing in Nigeria and in India (Affiong et al., 2017; Mahadevan et al., 2014).

In this study, half of the CL wearers agreed about having an eye examination before wearing. Same finding was reported by Affiong et al in India. On the other hand, Alasiri et al., (2015) in Saudi Arabia, reported that two-third of the participants got their CL from optical shop without first eye examination in the eye clinics. This practice could limit hygienic education and enhances more contact lens-related complications. In the current study, the level of knowledge about CL was excellent in almost half of the participants with significant gender differences in the level of knowledge. This level of knowledge was in keeping with that reported in Riyadh (Abbouda et al., 2016). Previous studies indicated that contact lens wearers expressed variable behavior with hand hygiene and cleaning (Arif & Hussain, 2017; Bhandari & Hung, 2012; Gyawali et al., 2014; Hickson-Curran et al., 2012).

In the current study the majority of the CL wearers exhibited excellent practice with hand hygiene and cleaning. Also they were reflected positive behavior with the use of CL solutions and replace them after the date of expiration. Poor hand hygiene, inadequate cleaning and in proper use of CL solutions will increase the CL related complications. Presence of contact lenses result in inflammatory changes, dryness, keratitis and even temporal visual loss in severe cases (Arif & Hussain, 2017; Efron & Morgan, 2006; Alabaidan et al., 2018). In keeping with this, wearers in this study experienced variable contact lens related complications specially eye redness, dryness and inflammatory changes.

Sleeping with contact lens might predispose to corneal infection and keratitis (Efron & Morgan, 2006). In the current study, only less than tenth of the wearers sleep with their contact lenses. This practice could help in prevention of contact lens- related complications. This study represented a foundation for the awareness and practice of the Jazan University students. The study explained the excellent knowledge and practice of the CL wearers. However, being cross sectional precluded generalization of the results. The small sample size used in this study limited the precise results and accurate correlation. Large sampling cross sectional and more qualitative studies are needed for future studying.

## 5. CONCLUSION

Contact lens wearing was well prevalent among Jazan University students. Contact lens wearers exhibited excellent knowledge and adequate practice regarding contact lens usage. Nevertheless, examination of the eye before use and the importance of periodic check-up will still need to be reinforced.

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### Author contributions

OA contributed to study conception and design, statistical analysis, final interpretation of data, and drafting and revising of the article, and gave final approval. Amani OA contributed to study design, acquisition, interpretation of data, and revision of the article, and gave final approval. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

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**Conflict of interest**

The authors declare that there are no conflicts of interests.

**Data and materials availability**

All data associated with this study are present in the paper.

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